

CLAIMS

What is claimed is:

1. A chill assembly for chilling a molten material during formation of a part, said assembly comprising:
 - 5 a mold platform for receiving a mold to be filled with a molten material to form a part;
 - a first platen moveable in a vertical direction relative to said molding platform;
 - a plurality of chills moveably supported by said first platen for quenching
 - 10 the molten material with each of said chills being moveable between a pre-chill position prior to quenching and a post-chill position after quenching; and
 - an alignment sub-assembly engaging said chills for aligning said chills in said pre-chill position after said chills have quenched the molten material and after said chills have moved to said post-chill position.
- 15 2. A chill assembly as set forth in claim 1 wherein said alignment sub-assembly further comprises a locator bar supported by said first platen defining a plurality of detents corresponding to said pre-chill position.
3. A chill assembly as set forth in claim 2 wherein said alignment sub-assembly further comprises a plurality of locators supported by said chills such that
- 20 said locators engage said detents to re-align said chills in said pre-chill position.
4. A chill assembly as set forth in claim 3 wherein said alignment sub-assembly further comprises a second platen supporting said chills and moveable in said vertical direction independent of said first platen.
5. A chill assembly as set forth in claim 4 wherein said alignment sub-
- 25 assembly further comprises a spring assembly between said locator bar and said first platen to allow said locator bar to flex and to reduce wear.

6. A chill assembly as set forth in claim 5 further comprising a pair of end caps disposed between said locator bar and said first platen for supporting said locator bar.

7. A chill assembly as set forth in claim 6 wherein said spring assembly is
5 mounted to at least one of said end caps.

8. A chill assembly as set forth in claim 4 further comprising brackets interconnecting said second platen and said chills to move said chills vertical relative to said locator bar.

9. A chill assembly as set forth in claim 8 further comprising a chill rod
10 slideably supporting said chills and said brackets.

10. A chill assembly as set forth in claim 1 wherein said chills are liquid cooled.

11. A chill assembly as set forth in claim 10 wherein each of said plurality of chills have an inlet and an outlet for receiving a cooling liquid to quench the molten
15 material.

12. A chill assembly as set forth in claim 1 wherein said chills are moveable along a X-direction between said pre-chill and said post-chill positions.

13. A chill assembly as set forth in claim 1 further comprising a lift in engagement with said first platen for driving said first platen upward and downward
20 in said vertical direction.

14. A chill assembly as set forth in claim 1 further comprising a package locator mounted to said mold platform for locating the mold relative to said first platen.

15. A chill assembly as set forth in claim 1 further comprising an upper
25 platform supporting said first and said second platens relative to said mold platform.

16. A method of forming a part from molten material, said method comprising the steps of:

- disposing a mold for a part on a mold platform adjacent a first platen;
- positioning a plurality of chills supported by a second platen in a pre-chill position relative to the mold;
- moving the first platen into contact with the mold such that the chills quench the molten material as the molten material begins to cool to form the part;
- injecting a molten material into the mold;
- moving the plurality of chills along a X-direction simultaneously with a shrinkage occurring in the part as the molten material cools such that the chills end in a post-chill position;
- moving the first platen out of contact with the mold to remove the chills from the molten material; and
- re-aligning the plurality of chills from the post-chill position to the pre-chill position.

17. A method as set forth in claim 16 wherein the step of re-aligning the plurality of chills is further defined as automatically re-aligning the chills upon removing the chills from the mold.

18. A method as set forth in claim 16 wherein the step of re-aligning the plurality of chills further comprises the step of moving the second platen independent of the first platen to re-align the chills in the pre-chill position.

19. A method as set forth in claim 18 wherein the step of re-aligning the plurality of chills further comprises the step of engaging a locator bar supported by the first platen with locators mounted to the chills to re-align the chills in the pre-chill position.

20. A method as set forth in claim 18 further comprising the step of biasing the locator bar in a downward direction to allow the locator bar to flex when engaging the locators.

5 21. A chill assembly for chilling a molten material during formation of a part, said assembly comprising:

a mold platform for receiving a mold to be filled with a molten material to form a part;

10 a first platen moveable in a vertical direction relative to said molding platform; and

a plurality of chills moveably supported by said first platen for quenching the molten material with each of said chills being moveable between a pre-chill position prior to quenching and a post-chill position after quenching, wherein said chills are liquid cooled.

15 22. A chill assembly as set forth in claim 21 wherein each of said plurality of chills have an inlet and an outlet for receiving a cooling liquid to cool said chills to quench the molten material.

23. A chill assembly as set forth in claim 21 wherein said chills are moveable along a X-direction between said pre-chill and said post-chill positions.

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24. A method of forming a part from molten material, said method comprising the steps of:

disposing a mold for a part on a mold platform adjacent a first platen;

25 positioning a plurality of chills supported by a second platen in a pre-chill position relative to the mold;

moving the first platen into contact with the mold such that the chills
quench the molten material as the molten material begins to cool to form the part;

injecting a molten material into the mold;

moving the plurality of chills along a X-direction simultaneously with a
5 shrinkage occurring in the part as the molten material cools such that the chills end
in a post-chill position;

moving the first platen out of contact with the mold to remove the chills
from the molten material after the part attains a semi-solid state; and

spraying the part while in the semi-solid state with a fluid to promote
10 additional cooling of the molten material with the chill being removed therefrom.

25. A method as set forth in claim 24 wherein the step of spraying the part is
further defined as spraying the part with water.

26. A method as set forth in claim 24 wherein the step of spraying the part is
further defined as spraying the part with water.

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